

**When camouflage fails: Predation of a huntsman spider *Damastes* sp.
(Araneae: Sparassidae) on a stick insect *Antongilia* sp.
(Phasmatodea: Bacillidae: Antongiliinae) from Madagascar**

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Abstract — Although laboratory trials suggest that stick insects (Phasmatodea) are a highly palatable prey group for spiders, field observations confirming this hypothesis are very rare. We report on a predatory event involving a huntsman spider of the genus *Damastes* (Araneae: Sparassidae) on a stick insect of the genus *Antongilia* (Bacillidae: Antongiliinae) from Madagascar. Despite the anti-predator adaptations that characterise this insect group (e.g. the cryptic camouflage) the stick insect was recognized and overwhelmed by the sparassid spider.

Key words — Betampona Strict Nature Reserve, eastern Madagascar, feeding behaviour, prey capture

Introduction and methods

Spiders are one of the most diverse and abundant groups of invertebrates being the seventh largest order in the animal kingdom. Almost 47000 species and over 4000 genera are described from around the world (World Spider Catalog 2017). Spiders are mainly predatory organisms feeding on a variety of invertebrates and even some small vertebrates (Forster 1995; Griswold 2003; Nyffeler & Knörnschild 2013; Rosa et al. 2016).

Records of predation on stick insects (Phasmatodea) by spiders are scarce and anecdotal not only in web weavers (Araneidae (*Nephila*): Robinson & Robinson 1973; Psecridae: Robinson & Lubin 1979), but also in cursorial hunting species (Salticidae: Swaine 1969) which generally have a good sight (Foelix 2010) and share similar habitats with phasmids. This is likely due to the anti-predator adaptations characteristic of this insect group such as camouflage traits (Bedford 1978; Evans & Schmidt 1990), behaviour (e.g. thanatosis: Bedford 1978; Carlberg 1986) and/or the possession of chemical defensive glands by some species (Eisner 1965; Dossey et al.

2009). Nevertheless, laboratory trials with species of the family Ctenidae suggest that phasmids are a highly palatable prey group for spiders (Nentwig 1990).

Here we report on a predatory event involving a huntsman spider of the genus *Damastes* (Araneae: Sparassidae) on a phasmid species of the genus *Antongilia* (Bacillidae: Antongiliinae) from Madagascar. The event was observed on 4 November 2013 at the Réserve Naturelle Intégrale de Betampona (= Betampona Strict Nature Reserve; 17°55'33.00"S, 49°12'30.30"E, 210 m a.s.l.; Toamasina Province), a low-altitude rainforest fragment on the eastern (Rosa et al. 2012).

Results and discussion

At around 20:00, the adult spider was standing motionless on a tree trunk facing downward at approximately 1.60 m height. The pedipalps and two front appendages were resting lightly on the trunk surface. With a fast movement, the spider lurched forward and pierced (with its fangs) the stick insect that was at approx. 20 cm of distance, gently walking by (swaying from side-to-side), capturing the prey (Fig. 1A).

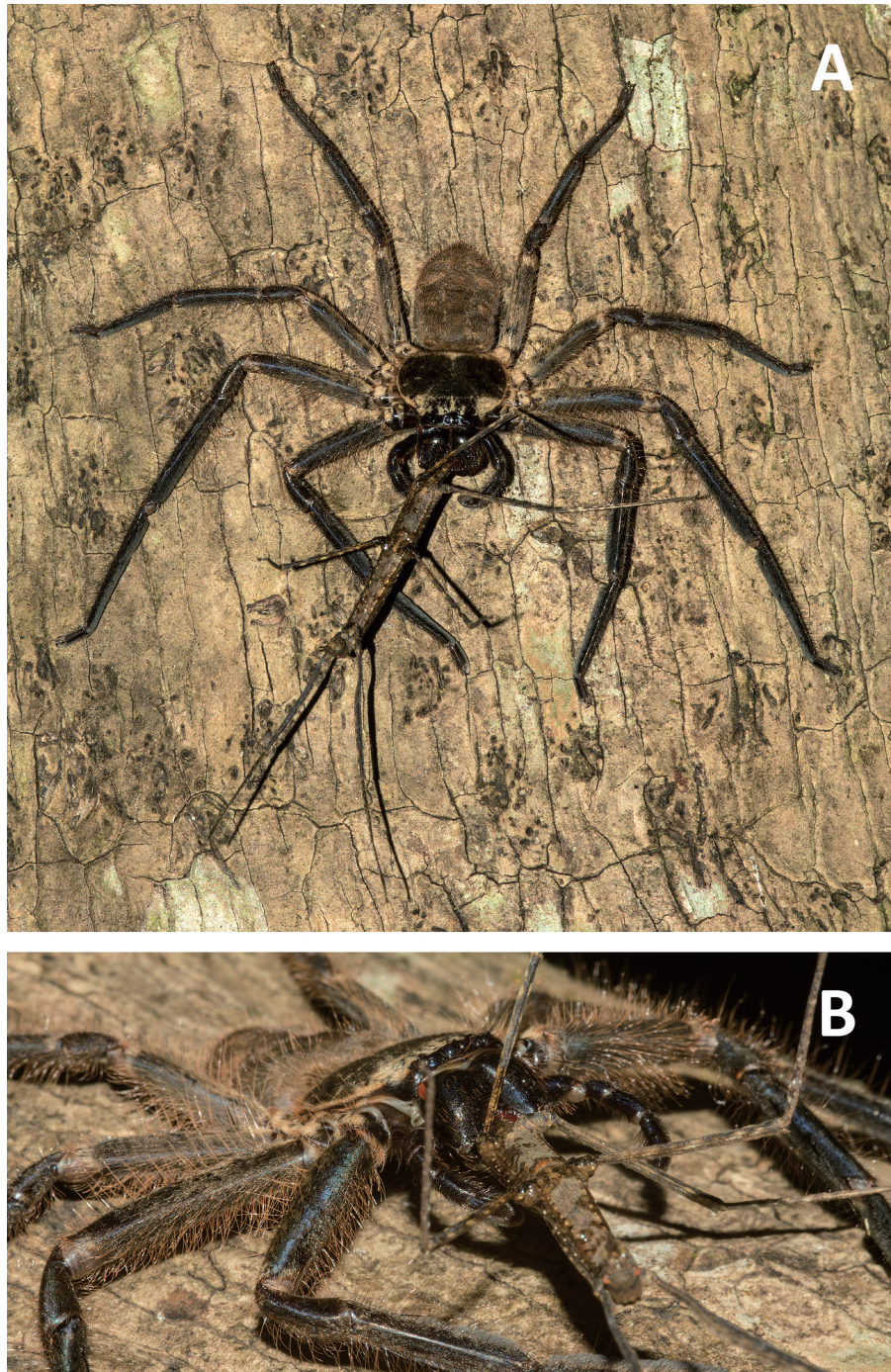


Fig. 1. Predation of a huntsman spider *Damastes* sp. on a stick insect *Antongilia* sp. in Betampona Strict Nature Reserve, Madagascar.

The phasmid was caught by its abdomen, right behind the posterior legs, where the spider likely injected the venom to immobilise it (Fig. 1B).

Huntsman spiders are known for their running hunting habits but they have poor vision and use mostly touch and vibration for catching prey (Griswold 2003). In the present case, the spider used a sit-and-wait approach, remaining

completely still until the phasmid came close enough. This strategy has been reported in other species of the family Sparassidae being effective against mealworms (*Tenebrio molitor*) and moth larvae (*Galleria* sp.) (Rowell & Avilés 1995), and also against the defence mechanisms of the preyed stick insect, in this case. Our field observation suggests that the sit-and-wait approach, rather than the active

search, may defy the phasmids' defence traits and corroborates the laboratory trials by Nentwig (1990), suggesting the idea that phasmids are a palatable prey group for spiders.

Records of inter-species interaction illustrating behaviour are rare among Malagasy invertebrates. Madagascar is a rich, highly biodiverse hotspot with one of the highest rates of endemism in the world, which is also true for the spider fauna (Griswold 2003; Agnarsson et al. 2015; Ubick & Griswold 2011). A review by Griswold (2003) reported that around 29% of the 207 spider genera and 85% of the described species are endemic to this island, with a true richness likely exceeding 3000 species (Griswold 2003). As to the family Sparassidae, around half of the recognized genera and 90% of the described species are endemic to Madagascar (Silva 2005; World Spider Catalog 2017).

Despite failing to identify the spider to the species level, accounts like this are important to shed some light on the complexity of the food webs among understudied groups of arthropods but also to develop ecological theories (Dangles & Casas 2012). With the high rates of deforestation in the country affecting all Malagasy biota (including invertebrates; Allnutt et al. 2008), the identification of the species and the report on their behaviour is a race against time to improve their conservation status.

Remark. Due to the lack of permits for invertebrates, the spider was not collected after the observation.

Acknowledgments

We thank Nicolas Cliquennois for helping with the stick insect identification, as well as Peter Jäger for helping with the identification of the spider. We extend our thanks to K. Freeman and I. Porton from Madagascar Fauna and Flora Group. Fieldwork was financially supported by the Saint Louis Zoo's Field Research for Conservation program (FRC# 12-12) of the Wildcare Institute and Gondwana Conservation and Research. This work is also funded by National Funds through FCT - Foundation for Science and Technology under the IF/00209/2014/CP1256/CT0011 Exploratory Research Project.

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Received September 29, 2017 / Accepted December 19, 2017